DEC STD 089-0 Semiconductor Mask Works Program

DOCUMENT IDENTIFIER: A-DS-EL00089-00-0000 Rev B, 06-Jul-1990

ABSTRACT: This standard summarizes the procedures and policies required to implement the semiconductor chip protection features of the Semiconductor Protection Act of 1984, Public Law 98-620, Title 17, United States Code, Chapter 9.

APPLICABILITY: This standard applies to Digital semiconductor chip manufacturing activities, U.S. and worldwide, and to all engineering and production activities engaged in the purchase of custom or semicustom semiconductor chips, including gate arrays or standard cell devices.

STATUS: APPROVED 29-Jun-1990; use VTX SMC for current status.

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CONTENTS

1 INTRODUCTION 1

2 SCOPE 1

3 RESPONSIBILITIES 1
3.1 PURCHASING 1
3.1.1 Appropriate Notice 1
3.1.2 Ownership or License Rights 2
3.1.3 Registration Materials 2
3.2 DESIGN ENGINEERS 2
3.3 PRODUCT ENGINEERS 3
3.4 DEVICE AND MATERIALS ANALYSIS LABORATORY 3
3.5 QUALITY CONTROL 3
3.6 DOCUMENT CONTROL 3
3.7 ENGINEERING LAW SECTION 3
3.8 MASK WORKS PROGRAM ADMINISTRATOR 4

Appendix A CHIP AGREEMENT CHECKLIST 5

A.1 COMMODITY CHIP PURCHASE AND CUSTOM/SECOND SOURCE TERMS 5

A.2 CUSTOM PRODUCT/SECOND SOURCE TERMS 6
A.2.1 NOTICE REQUIREMENTS 6
A.2.2 OWNERSHIP REQUIREMENTS 6

Appendix B REFERENCED DOCUMENTS 7

B.1 Other Documents 7

FIGURES

1 Proper Mask Works Marking for Die and Package 2

1 INTRODUCTION

The Mask Works Program implemented at Digital Equipment Corporation is a comprehensive and integrated semiconductor chip protection program intended to augment the Corporation's Intellectual Property Protection Strategy.

A semiconductor chip contains *mask works*, which is a series of related images having or representing the three dimensional features of shapes, patterns, and configurations of the surface layers. This document summarizes the procedures and policies required to implement the semiconductor chip protection features of the Semiconductor Protection Act of 1984, Public Law 98-620, Title 17, United States Code, Chapter 9 (referred to as the *Act* in this document).

Digital implements the protection afforded by the Act in two primary areas: notice provisions on the chips, and registration of the mask materials at the U.S. Copyright Office. Responsibilities for notice and registration activities are detailed below.

The Mask Works Program must be coordinated with the patent filing program (both United States and non-U.S.) to obtain the appropriate copyright, trade secret, and trademark protection. Coordination of the two programs ensures the intellectual property protection provided by implementing the Mask Works Program.

2 SCOPE

This standard applies to all Digital semiconductor chip manufacturing activities, U.S. and worldwide, and to all engineering and production activities engaged in the purchase of custom or semicustom semiconductor chips, including gate arrays or standard cell devices.

3 RESPONSIBILITIES

3.1 PURCHASING

All purchasing activities of manufacturing, assembly, or engineering organizations involved with the direct procurement of semicustom or custom semiconductor chips must implement the Mask Works Program to ensure Digital protects its proprietary rights in the mask works used to fabricate Digital's proprietary semiconductors.

The Chip Agreement Checklist (Appendix A) provides guidelines for negotiating purchase agreements, developmental agreements, or Basic Order Agreements under which custom or semicustom chips are manufactured outside Digital for Digital's sole use or for use by an authorized licensee of Digital. While it is recognized that every situation will be unique, it is recommended that, as a minimum, the following be obtained in the agreements.

3.1.1 Appropriate Notice

A notice requirement as defined in the Act consists of the following.

- The encircled M and the name of the legal owner is required, as a minimum.
- For protection in countries that have not enacted specific semiconductor chip mask protection legislation, the copyright designator © and the year of first commercial exploitation must also be included.

If the chip contains software in the form of microcode, the copyright notice provides preliminary copyright protection for that software.

Figure 1: Proper Mask Works Marking for Die and Package

NOTE

Deviations from this mark may be authorized in specific cases.

3.1.2 Ownership or License Rights

The Act mandates that only the owner of the mask works rights or the assignee or licensee of substantially *all the rights* in the mask works is eligible for registration and subsequent protection under the Act. Therefore, it is strongly recommended that the grant of ownership rights in the Digital proprietary features of the mask works for custom and semicustom devices be obtained in the agreement.

Digital desires ownership of all mask work rights in any layer that is customized to Digital proprietary design. This includes all metalization layers for gate array devices and usually will include all layers for standard cell and full-custom devices. Digital will disclaim rights in specific cells and/or megacells of the vendor that are proprietary to the vendor, apart from their specific arrangement and metalization/interconnect as part of the Digital proprietary design.

If the vendor is unwilling to agree to these terms, contact the Mask Works Program Administrator in the Law Department.

3.1.3 Registration Materials

Forty unpackaged die are required to ensure sufficient material for U.S. and non-U.S. registration of the chips. These die are photographed at Digital's Device and Materials Analysis Lab. The die and the photos are registered in the U.S. Copyright Office and in the non-U.S. mask works registration offices. Coordination of these and the other provisions of the Chip Agreement Checklist should be made with the Mask Works Program Administrator in the Law Department.

3.2 DESIGN ENGINEERS

The Design Engineers responsible for chip designs must ensure the marking in Figure 1 appears on every level of the mask set. A marking on each mask must be placed in such a manner that it is clearly visible on the surface of unpackaged die. An unused area of the chip surface must be marked; the mark must not interfere with routing or electronic functions required by the chip design.

The marking requirement applies to every device manufactured by Digital or designed by Digital employees. The marking must be included in both the design file requirements for each process and in the tech file requirements for each device. Refer to Figure 1 for appropriate markings.

3.3 PRODUCT ENGINEERS

Every Product Engineer responsible for a semiconductor chip product must ensure that the die is appropriately marked and that the package and package specification include the marking in Figure 1.

Furthermore, to obtain Design Release (DR), the Product Engineers must provide to Document Control the following registration materials.

- Forty unpackaged die, preferably electrical failures.
- Two sets of 8- by 10-inch color photos. Each set consists of a photo of each of the four corners of the die, magnified to a minimum of 40 power such that when the four photos are placed together on a flat surface, the surface of the die is completely represented in every aspect and may be clearly seen in detail, including the mask works notice.
- Two 4- by 5-inch color negatives of the chip surface.
- One 35-mm color slide of the die. The photos, negatives, and slides are obtained through Digital's Device and Materials Analysis Lab.
- An information form (available from Document Control) indicating the product, chip type, revision levels, and pattern generation date.

3.4 DEVICE AND MATERIALS ANALYSIS LABORATORY

The U.S. Copyright Office's registration requirements for the technical quality and specifications of the photos require the expertise of the Device and Materials Analysis Lab. The responsible Product Engineer will obtain the photos for chips manufactured by Digital. The Mask Works Program Administrator will obtain the photos for purchased chips.

3.5 QUALITY CONTROL

Quality Control for the Digital manufactured chips and the custom and semicustom chips is responsible for ensuring that the marking, with the appropriate mask works notice, is included on both the die and on the package. Refer to subheads 3.2 and 3.3.

3.6 DOCUMENT CONTROL

Document Control is responsible for ensuring that the specifications include appropriate marking on the die and on the package. Document Control is also responsible for collecting the registration materials (including photographic material and die) from the Product Engineer prior to formal release of the product, and for forwarding the materials to the Mask Works Program Administrator in the Engineering Law Section.

3.7 ENGINEERING LAW SECTION

Attorneys responsible for legal support of engineering organizations must ensure that the purchasing activities within their organizations follow guidelines provided in the Chip Agreement Checklist. Specific questions on a custom chip acquisition may be answered directly or referred to the Mask Works Program Administrator.

Engineering Law Section attorneys shall ensure that the purchasing activities within their engineering organizations submit a copy of all chip purchase agreements for custom or semi-custom chips to the Mask Works Program Administrator.

3.8 MASK WORKS PROGRAM ADMINISTRATOR

The Administrator is responsible for the implementation and maintenance of the Mask Works Program in accordance with the following primary objectives.

- Coordinate mask works registrations with the United States and foreign patent filing programs. In particular, this requires that registrations not be obtained until patent applications are filed in those countries having an absolute novelty requirement. Furthermore, registrations must not be filed in the U.S. Copyright Office until the scope of all patentable subject matter within a chip is determined and a decision is made that all patents have been filed or there are no patentable inventions contained in the chip. These determinations will be entered in the docket process.
- Maintain the effectiveness of the Program by conducting the necessary training for the following organizations: Purchasing, Design and Product Engineering, Quality Control, and Document Control.
- Maintain the registration status of each chip in accordance with the regulations for the Act. The contracts under which purchased chips are acquired must be included in the file for each chip and summarized in the docket information. The appropriate dates and ownership rights must be confirmed for each chip, in the case that further action is required.
- Provide a quarterly program report to the Assistant General Counsel, Engineering Law Section. The quarterly program report must indicate the status of each registration and of the docketed chips not yet registered.
- Provide support for enforcement activity by retaining the registration files and the contracts for purchased chips, which delineate ownership rights.
- Provide appropriate assistance to the groups involved in the program. Program modifications may be made as necessary to provide the best protection for the mask works while maintaining close coordination with the Corporation's other activities in the Intellectual Property Protection Program.

APPENDIX A CHIP AGREEMENT CHECKLIST

The following checklist is designed to cover only those special terms related to semiconductor chip acquisitions by Digital, which are terms not normally included in a standard commodity purchase. Note that the list is not all inclusive. Begin the checklist by answering the following questions.

- Are the chips commercially available (that is, off-the-shelf or catalog products) from at least two independent sources? If the answer is Yes, add the terms in subhead A.1.
- Is this chip or chip set either a second source custom product for Digital produced chips or a sole source custom development agreement? If the answer is Yes, add the terms of agreement in subhead A.1 and A.2.

A.1 COMMODITY CHIP PURCHASE AND CUSTOM/SECOND SOURCE TERMS

Answer the following questions as they apply to commodity chip purchase and custom /second source terms.

- Does the license reservation provision contain a reference to mask works rights?

  It is agreed that no license under any patents, copyrights, mask work rights, or trade secrets of either company is granted by a disclosure of information hereunder, except as provided herein.

- Does the infringement indemnity provision contain a reference to mask works?

  When notified in writing of any action brought against Digital based on a claim that the material provided hereunder or any of its parts, or its manufacture by (*Vendor*), infringes any patent, trademark, mask work right, copyright right, or constitutes misappropriation of a trade secret, (*Vendor*) will defend such action at its expense and will pay the cost and damages awarded in any such action.

- Is the definition of mask works included in the definitions?

  Mask works or *mask work sets* shall mean the mask or series of masks, or other images or series of images, however, fixed or encoded, utilized to implement in silicon, or other material, the predetermined three dimensional pattern of the metallic, insulating or semiconductor material which is to be present upon or removed from a semiconductor device, required for (*Vendor*) to utilize its process to implement the logic design. Mask works or mask work sets shall not include, for purposes of this agreement, such masks or series of masks or images or series of images which are utilized by (*Vendor*) to fabricate devices which are in no way unique to any such devices of Digital.

- Is the packaging specification unique to Digital?

  If so, it should contain the package marking requirements shown in Figure 1.

A.2 CUSTOM PRODUCT/SECOND SOURCE TERMS

A.2.1 NOTICE REQUIREMENTS

Is there a requirement that the mask works and therefore each die are marked? Is there a requirement that the package be legibly marked? If so, use the following marking.

Key

M represents the mask works notice.

C represents the copyright notice.

19XX indicates the year of design.

A.2.2 OWNERSHIP REQUIREMENTS

- Does the contract expressly delineate Digital as the owner of the mask work rights?

  (*Vendor*) understands and expressly agrees that Digital is the owner of the Mask Work Rights in the material produced or delivered under this agreement.

  (*Vendor*) further agrees to delivery forty finished die, unmounted electrical failures, for each device type delivered hereunder to the technical contact specified in this agreement. These devices will be utilized by Digital for Mask Works Registration and shall be provided at no additional cost.

- License Grant and Restriction: Does the grant of manufacturing license restrict further sales?

  Digital agrees to grant and hereby grants to (*Vendor*) a non-exclusive, worldwide, royalty free license to manufacture for Digital's sole and exclusive use the material covered by this agreement. Digital expressly reserves and retains all intellectual property rights of said material including the exclusive rights of the owner of a maskwork under the Semiconductor Chip Protection Act of 1984. The license granted by Digital in this paragraph is personal to (*Vendor*) and may not be assigned, sublicensed, or otherwise transferred and shall remain in effect only during the term of this agreement.

APPENDIX B REFERENCED DOCUMENTS

B.1 Other Documents

Document Number	Document Title
N/A	*Semiconductor Protection Act of 1984, Public Law 98-620, Title 17, U.S. Code, Chapter 9*

Copies of this document may be ordered from the Mask Works Administrator, Law Department Engineering Law Section.

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+---------------------------------------------------------------------+
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